

### ABSTRACT

The invention provides polynucleotides and polypeptides encoded therefrom having advantageous properties, including an ability of the polypeptides to preferentially bind a CD28 or CTLA-4 receptor at a level greater or less than the ability  
5 of human B7-1 to bind CD28 or CTLA-4, or to induce or inhibit altered level of T cell proliferation response greater compared to that generated by human B7-1. The polypeptides and polynucleotides of the invention are useful in therapeutic and prophylactic treatment methods, gene therapy applications, and vaccines.

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